Are You Ready for Risk? Time Preferences and Risk Attitudes in Peer to Peer Lending Platforms

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Abstract
Despite the booming Fintech industry, Peer-to-Peer (P2P) lending platforms continue to play an insignificant role. This study explores differences in time preferences and risk-attitude between P2P lenders and the general public. The findings indicated that P2P lenders are less risk-averse and have future preferences, indicating that this P2P platform is perceived as a risky instrument.

Keywords: Finance Technology, P2P Platform, Time Preference, Risk Aversion.

JEL classification: G41, G23, D91

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1. Introduction

Online platforms have replaced conservative financial institutions in recent years, for example: Unlike traditional financial institutions, Peer-to-Peer (P2P) platforms allow people to lend money directly to individuals and small businesses without having to go through traditional financial institutions like banks. There was an expectation that these platforms would influence the lending market in the same way as digital banking (Mariotto & Verdier, 2015), but the P2P sector has so far contributed only a minor share to Israeli finance (Zwilling et al., 2020; Klein et al. 2021). A possible explanation for this phenomenon can be found in Zwilling et al. (2020), who explored the public's perception of these platforms and found that many perceive them to be too risky.

Although a number of studies exist on P2P lending platforms, most have concentrated on the characteristics of these platforms, as well as granting and receiving loans (e.g., Mariotto, & Verdier, 2015; Bachmann et al., 2011), rather than on lender characteristics and motivations. This paper aims at filling this gap and examines whether active P2P lenders and the general public differ in their preferences, with an emphasis on time preference and risk-attitude.

Time preference is relevant since it indicates the preference for immediate consumption over consumption in the future. Since people prefer present consumption over equal future consumption, compensation is required for deferring, according to their own time preferences. The subjective discount rate (SDR) can be calculated using the requested compensation and used as an indicator of time preference (e.g. Shtudiner, 2018).

As individual’s preference for the present increases, so does the required compensation and as a result, the SDR (e.g., Bayer et al., 2018). Risk tolerance is another variable that can affect decision-making. A person's tolerance for financial risk can be defined as the maximum level of uncertainty he is willing to tolerate when making financial decisions (Grable, 2000).

We hypothesize that due to the perceived risk on these platforms, lenders will have lower risk aversion and higher future preference compared to the general public (non-users). In addition, the stronger the lender’s future preference, the higher the amount they will be willing to lend in these platforms.
2. Method

SDR estimates for different time periods were used in order to estimate individuals' time preferences. We employ the model developed by Booij and Van Praag (2009). Specifically, participants were required to specify how much they will ask as a condition for delaying a sum of money they are supposed to receive immediately. Using the delayed amount and the required amount, the discount rate was determined. Participants were given three options for postponing the receipt of sums, so that the function could be mapped for different time ranges: Four years, one year, and two months of postponement of 5,000 NIS (about $1,500).

We analyzed two different measures of a person's risk preference. First, we calculated the economic risk preference based on the following question, that was also used by Booij and Van Praag (2009): "Imagine you are offered a ticket for a lottery with 10 participants (so you have a 1:10 chance of winning). The prize in the lottery is NIS 5000 in cash. What is the maximum amount you would be willing to pay for such a lottery ticket? I would be willing to pay no more than NIS ___ in order to purchase the lottery ticket." Increasing amounts offered for the lottery are indicative of riskier economic choices. Second, based on a Likert scale of 7, subjects were asked to indicate whether they consider themselves to be risk takers. As well as demographic factors (gender, age, income, education, marital status), the actual use of the platform was also examined.

Our study recruited lenders for the study by asking one of the companies to send a message with a link to the questionnaire to all its lenders. Full anonymity was maintained, and 72 active lenders completed it. To compare to the P2P active lenders, 81 respondents from the general public (non-users) completed a similar questionnaire.

Participants ranged in age from 20 to 74 years old, with a mean age of 41.3 (SD 16.04). There were 69% of respondents who were married, 26% who were single, and 5% who were divorced or widowed. Most respondents (60%) had above average income, the income for 15% was average and the income for 25% was below average. The majority of respondents (77%) held a college degree, 26% were economics majors (or related fields), and 19% were employed in an economics-related field.
3. Results

First, we analyzed the differences in risk tolerance between two groups, the general public (GP), who are inactive on P2P platforms, and active lenders (AL) in these platforms. In order to conduct this analysis, several methods were used. First, we compared the willingness to pay (WTP) for a lottery ticket with reward of 5,000 NIS with chances to win 1:10. The average WTP was higher in the AL group (M = 178.96, SD = 210.50) than in the GP group (M = 107.88, SD = 150.61) and the difference was significant (t-test, equal variances not assumed, t = -2.176, p = 0.031). Second, we compared the self-reported risk seeking (1-7 scale, 7 high) between the two groups. Subject answers to this question also exhibited a significant difference (t-test, t=-2.105, p=0.037). Compared with the GP group (M = 2.83, SD = 1.78), the AL group averaged 3.46 (SD = 1.63). As can be seen from these two analyses, risk aversion is lower within the AL group than in the GP group.

Next, we investigated if there is a difference between GP and AL in terms of time preference. Three time periods were asked about (two months, one year and four years), and using the following formula we computed the annual SDR for each period:

\[ SDR = \left( \frac{F}{P} - 1 \right) * t \]

Where \( F \) (future value) is the delayed outcome the participants are willing to accept at time \( t \) and \( P \) (present value) is the present outcome they are willing to postpone (in our questionnaire, \( P \) equals 5,000). The value \( t \) represents the sub-periods in annual terms (two months \( t=6 \); one year \( t=1 \); four years \( t=0.25 \)).

The annual SDR differences between the two groups are displayed in Figure 1. The SDR for all time periods was lower for AL compared to the GP one, which reflects a stronger present preference among GP. A t-test (equal variances not assumed) was conducted for the difference in SDR means. The results are displayed in Table 1. For all time periods, there was a statistically significant difference.
Figure 1: Comparison of Annual SDR between AL and GP

![Comparison of Annual SDR between AL and GP](image)

Table 1: Comparison of Annual SDR between AL and GP

<table>
<thead>
<tr>
<th></th>
<th>Active Lenders (s.d.)</th>
<th>General Public (s.d.)</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Months</td>
<td>69.49% (2.44)</td>
<td>200.12% (4.43)</td>
<td>T=21.37 p=.002</td>
</tr>
<tr>
<td>One Year</td>
<td>28.21% (.51)</td>
<td>66.86% (.14)</td>
<td>T=2.369 p=.007</td>
</tr>
<tr>
<td>Four Years</td>
<td>37.27% (1.22)</td>
<td>66.21% (1.27)</td>
<td>T=1.335 p=.061</td>
</tr>
</tbody>
</table>

Note: Standard deviations are in parentheses.

In order to estimate the difference in time preferences between P2P lenders and the general public, additional variables, which we presumed would affect an individual’s SDR, were also weighted in the calculation that used a nonlinear model (exponential function).

Additionally, we included variables, which we presume would affect a person’s SDR, as part of the calculation involving a nonlinear model (exponential function), and the following function was used:

\[ P = F \ast D(r, t) = F \ast e^{-t(r)} \]
\[ P \text{ represents the present value of the deferred amount, } F \text{ represents the amount requested for delay (the future value), } D \text{ represents the discount function (discounting the future relative to its present value), and } t \text{ represents the time period of the delay (in days). We assume that } r \text{ is a function of the individual's traits and characteristics.} \]

\[ r = f(\text{active lenders, age, male, income, married, risk premium, risk subjective}) \]

The independent variables are: Active Lenders (equals 1 for active lenders, 0 otherwise), Age, Male (equals 1 for males, 0 otherwise), Income (equals 5 for far above average income, 4 above average, 3 average, 2 below average and 1 far below average), Married (equals 1 for married subjects, 0 otherwise) and two measures for risk attitude. For each participant, we calculated the risk premium (RP) using the lottery question as follows:

\[ \text{Risk Premium (RP)} = \frac{E(X) - WTP}{E(X)} \]

Where \( E(x) \) is the lottery’s expectancy value (in our questionnaire it equals 500) and WTP refers to the maximum that a person is willing to pay for a lottery ticket. The second variable, risk subjective, is a self-reported risk seeking (1-7 scale, 7 high).

This model describes how \( r \), the discount factor, is composed of several factors that together determine its rate. Besides the research variables, we also incorporated other variables that we considered relevant in the following formula, such as age and income:

\[ P = F \times e^{-t(K+a*active \text{ lenders}+b*age+c*income.....)} \]
\( P \) represents the present value of the deferred amount, \( F \) represents the amount requested for delay (the future value), \( t \) represents the time period (in days) of the delay, \( K \) represents the discount rate component unaffected by the variables, and the impact of each variable on the discount rate is reflected by the coefficients \( (a, b, c, \text{etc.}) \). For the purpose of estimating the intensity and direction of effect of each variable on the discount rate, we estimated \( K \) and the coefficients through a nonlinear regression analysis. The discount functions were determined by evaluating a single function using all the observations in the questionnaire.\(^1\) Based on the different amounts participants requested for various time periods, the discount rate \( r \) is estimated for the research population. Results are shown in Table 2.

The coefficient of the *Active Lenders* in Model III was found as negative and significantly different from zero. In line with Figure 1 and Table 1, this result shows that the SDR of AL is lower than that of GP. In other words, the future preference of active lenders is found to be higher. The results also show that men, married subjects, and subjects with higher risk seeking had a higher future preference.

In the next step, we tested the hypothesis that lenders with lower SDR are willing to invest higher amounts in P2P platforms. We ran a three-stage hierarchical multiple regression with *investment amount* as the dependent variable. In the first stage, the control variables, *age, male, income and married* were included. The second stage included *risk premium* variable, indicating the risk seeking of the lenders, and the third stage included the variable *SDR* that was calculated in annual terms. The results are displayed in Table 3.

\(^1\) Considering all respondents answered for three delay periods, we used a cluster-corrected standard errors model.
The results of the third stage display a connection between time preference and the investment amount. The negative and significant coefficient of this variable shows that the higher the SDR (weaker future preference) the lower the amount invested. Each increase of one percent in SDR reduces the amount by 1,509 NIS. Introducing this variable in the third stage explained an additional 6% of variance of the dependent variable. This change in the explained variance was found significant (p=0.069).

Introducing the variable of risk seeking in the second stage added only 0.6% of variance of the dependent (not significantly different from zero), which shows that there is a greater importance to time preference rather than risk attitude. In all stages, Age's coefficient is positive and significant, which shows that the older the lender is, the more he is willing to lend.
4. Conclusions

The study showed that risk preferences and time preferences differ between P2P lenders and the general public. P2P active lenders had lower risk aversion as well as higher future preference compared to the general public. Our results confirm that P2P platforms are still perceived by the public as a risky-non beneficial investment platform, therefore the risk-averse withdraw from investing through this instrument. Thus, although this technology embodies great potential to lead the finance lending market in the future, it still makes up a minor market share compared to other financial institutions such as banks and investment houses.
References


